



ELSEVIER

Contents lists available at ScienceDirect

## North American Journal of Economics and Finance



# Time-varying dependence between stock and government bond returns: International evidence with dynamic copulas



Rania Jammazi<sup>a,b,c,\*</sup>, Aviral Kr. Tiwari<sup>d</sup>, Román Ferrer<sup>e</sup>,  
Pablo Moya<sup>f</sup>

<sup>a</sup> IPAG Business School, Boulevard Saint Germain, Paris, France

<sup>b</sup> Faculty of Management and Economic Sciences, Sousse, Tunisia

<sup>c</sup> LAREQUAD, Faculty of Management and Economic Sciences, Tunis, Tunisia

<sup>d</sup> Faculty of Management, Room No.: Block C-204, IBS Hyderabad, IFHE University, Dontanpalli (Village), Shankerpalli Road, Hyderabad, A.P. 501203, India

<sup>e</sup> Department of Actuarial and Financial Economics, Faculty of Economics, University of Valencia, Avda. Tarongers, s/n, 46022 Valencia, Spain

<sup>f</sup> Department of Economic and Financial Analysis, University of Castilla-La Mancha, C/Santa Teresa Jornet, s/n, 16071 Cuenca, Spain

### ARTICLE INFO

#### Article history:

Received 18 October 2014

Received in revised form 12 March 2015

Accepted 16 March 2015

Available online 27 March 2015

#### JEL classification:

C40

E44

F30

G15

#### Keywords:

Stock returns

Government bond returns

Dependence

Flight-to-quality

Time-varying copulas

### ABSTRACT

This paper investigates the dependence pattern between stock and long-term government bond returns for a wide range of developed countries over the last two decades by using a dynamic DCC-GARCH-copula model. This approach allows obtaining a flexible and comprehensive description of the time variation in the linkage between stock and bond markets.

The empirical results show that the dependence structure between stock and 10-year government bond returns varies significantly over time for most countries. In particular, a positive stock–bond association is observed during the 1990s, while the relationship becomes negative from the early 2000s, supporting the presence of flight-to-quality effects. In addition, no evidence of asymmetric and tail dependence is found for the vast majority of countries.

© 2015 Elsevier Inc. All rights reserved.

\* Corresponding author at: LAREQUAD, Faculty of Management and Economic Sciences, Tunis, Tunisia.

Tel.: +216 20 176 533/71 233 318.

E-mail addresses: [jammrania2@yahoo.fr](mailto:jammrania2@yahoo.fr) (R. Jammazi), [aviral.eco@gmail.com](mailto:aviral.eco@gmail.com), [aktiwari@ibsindia.org](mailto:aktiwari@ibsindia.org) (A.Kr. Tiwari), [Roman.Ferrer@uv.es](mailto:Roman.Ferrer@uv.es) (R. Ferrer), [Pablo.Moya@uclm.es](mailto:Pablo.Moya@uclm.es) (P. Moya).

## 1. Introduction

Stocks and bonds constitute the two major asset classes traded on capital markets and the building blocks of most investment portfolios because of their different risk-return characteristics. Understanding the nature of the linkage between stock and government bond returns is of great interest for investors, portfolio managers and policy makers as it has crucial implications for asset allocation, portfolio diversification, risk management and monetary policy transmission. It has been frequently argued that the relationship between stock and bond returns is positive during periods of macroeconomic stability since both stock and bond markets are influenced by common macroeconomic factors such as inflation expectations or expected economic growth. However, there may also be a negative stock–bond association induced by the flight-to-quality phenomenon. Flight-to-quality refers to that, in times of stock market turbulence, investors become more risk averse and adjust their portfolios moving from risky assets such as stocks to safer assets such as long-term government bonds, thus causing a stock–bond decoupling.

The relationship between stock and government bond returns has received a great deal of attention in the financial literature since the seminal work of Keim and Stambaugh (1986). Linear correlation has been typically used as a measure of dependence between stock and bond returns due to its simplicity. Early contributions were based on rational expectations present value models that jointly price stocks and bonds under the assumption that the stock–bond correlation remains constant over time (Campbell & Ammer, 1993; Shiller & Beltratti, 1992). Subsequent empirical studies have, however, clearly illustrated the time-varying nature of the link between stock and government bond markets (Connolly, Sun, & Stivers, 2005; Gulko, 2002; Ilmanen, 2003; Scruggs & Glabadanidis, 2003). Multivariate GARCH (Generalized Autoregressive Conditional Heteroscedasticity) models have become the most popular approach to investigate the dynamic stock–bond correlation. The DCC (Dynamic Conditional Correlation)-GARCH model proposed by Engle (2002) has proven to be particularly well suited for describing the time-varying comovement between stock and bond markets (Aloui, Hammoudeh, & ben Hamida, 2015; Andersson, Krylova, & Vähämaa, 2008; Baur & Lucey, 2009; Dacjman, 2012). An obvious limitation of multivariate GARCH processes is that they are built on the assumption that the conditional joint distribution of stock and bond returns follows an elliptical distribution with linear correlation, such as the multivariate Gaussian or Student-*t*. Nevertheless, this assumption is violated in many cases as the real association between financial returns is often more complicated, including for example nonlinear or tail dependence (Wu & Lin, 2014).

In this context, a strand of research that models the dependence between stock and bond returns through copula functions has emerged with force over the last years (Lee, Huang, & Lin, 2013; Yang & Shigeyuki, 2015). This growing popularity has to do with the fact that copulas are able to reflect the whole dependence structure between financial asset returns, beyond linear correlation captured by multivariate GARCH processes. Moreover, copulas do not require imposing any assumption on the joint distribution of asset returns. Initial copula-based studies in this field concentrated on constant copulas (Durand, Junker, & Szimayer, 2010; Gonzalo & Olmo, 2005). However, more recent contributions consider time-varying (conditional) copulas, which allow better characterizing the dynamic comovement between stock and government bond markets (Chang & Hsueh, 2013; Chui & Yang, 2012; Nguyen & Nguyen, 2014; Wu & Liang, 2011; Wu & Lin, 2014). These studies are predominantly focused on the US case (with the exception of Chang & Hsueh, 2013) and document a significant variation over time in the stock–bond nexus. In particular, a negative association between stocks and bonds appears since the early 2000s, which has been attributed to the presence of flight-to-quality effects from stocks to long-term government bonds, mainly during periods of stock market uncertainty. Table A1 in Appendix A summarizes prior studies on the stock–bond link based on copula models.

The aim of this paper is to provide a thorough analysis of the dependence structure between stock and long-term government bond returns in a large sample of developed countries by adopting a time-varying DCC-GARCH-copula approach. This framework combines two approaches broadly used to characterize the dynamic comovement between variables, namely the DCC-GARCH model and conditional copulas. The DCC-GARCH-copula approach permits modeling the conditional correlation (via a DCC-GARCH) and the conditional dependence (via a copula) separately and simultaneously for

Download English Version:

<https://daneshyari.com/en/article/972630>

Download Persian Version:

<https://daneshyari.com/article/972630>

[Daneshyari.com](https://daneshyari.com)